Name: Date:

Polynomial Factoring solution (version 9)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 50 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(50)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 200}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-56}}{2}$$

$$x = \frac{12 \pm \sqrt{-4 \cdot 14}}{2}$$

$$x = \frac{12 \pm 2\sqrt{14}\, i}{2}$$

$$x = 6 \pm \sqrt{14}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 2i$ and $-8 + 6i$ in standard form $(a + bi)$.**

Solution

$$(7 + 2i) \cdot (-8 + 6i)$$

$$-56 + 42i - 16i + 12i^2$$

$$-56 + 42i - 16i - 12$$

$$-56 - 12 + 42i - 16i$$

$$-68 + 26i$$

Polynomial Factoring solution (version 9)

3. **Write function $f(x) = x^3 + 7x^2 + 14x + 8$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	7	14	8
-4		-4	-12	-8
	1	3	2	0

$$f(x) = (x + 4)(x^2 + 3x + 2)$$

$$f(x) = (x + 4)(x + 1)(x + 2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 2)^2 \cdot (x - 3) \cdot (x - 7)^2$$

Sketch a graph of polynomial $y = p(x)$.